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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,295	11/24/2003	Sergio Martins Loureiro	130497-1	4132

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GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH  
PATENT DOCKET RM. BLDG. K1-4A59  
NISKAYUNA, NY 12309

EXAMINER

PARKER, FREDERICK JOHN

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/720,295

Applicant(s)

LOUREIRO ET AL.

Examiner

Frederick J. Parker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) ~~1001~~<sup>1-61</sup> is/are pending in the application.
- 4a) Of the above claim(s) 1-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 47-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Election/Restrictions***

Applicant's election with traverse of claims 47-61 in the reply filed on 4-17-06 is acknowledged. The traversal is on the ground(s) that the search of the article, array, and method would not pose a burden of search and examination. This is not found persuasive because the presence of multiple inventions would necessarily, in and of itself, cause an undue burden on the Examiner because of the excessive time required to perform separate searches of different inventions. However, the burden on the Examiner extends to PATENTABILITY ISSUES associated with, and evolving from, searching for multiple different inventions. Issues related to one statutory class are generally very different from those of other statutory classes. That is, issues arising from method claims would potentially be very different from those of article claims, and may require complex evidence to resolve critical issues which would be dissimilar and unfamiliar to an Examiner in an unrelated art area. Hence, the examination of multiple inventions, in this case directed to method, article, and array, represents a serious and undue burden on the Examiner because of excessive and non-overlapping searches of three inventions which, under MPEP 2113 need not be co-extensive, and the evolution of complex and unfamiliar patentability issues related to examining multiple and distinct inventions. Restriction is therefore proper under the guidelines of MPEP 803. The requirement is still deemed proper and is therefore made **FINAL**.

***Drawings***

1. The drawings are objected to because Figure 3 is blank/ contains no illustration.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

2. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

*Abstract should reflect the subject matter of the elected claims.*

3. The disclosure is objected to because of the following informalities: (1) [0006] line 4, at least one word is missing because the sentence is awkward. (2) [0041,42] all instances of "cristoballite" are mis-spellings. Appropriate correction is required.

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4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 49,56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claims 49,56 are vague and indefinite because in (a), the meaning of “predetermined concentration” in context is unclear since “predetermined” does not convey the intended concentration of the oxide precursor.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 47,49,50,52-54,56,57,59-61 are rejected under 35 U.S.C. 102(e) as being anticipated by Pham et al US =6548440 (EFD = 5/26/1999).

Pham teaches forming a mesoporous silica structure comprising a porous structure in which are templated metal or metal oxide particles (e.g. titania or other ceramics) of less than 100 nm in size (col. 12, 28-29) inside the porous framework of the mesoporous silica. Metal oxide precursors (col. 5, 43-46; col. 9, 15-18) are exemplified as nitrates, halides, alkoxides, etc which are infiltrated into the silica. Since the silica contains a regular mesoporous structure and the particles are templated therein, the structure forms an ordered array of nanoparticles within the mesoporous structure.

The process is provided on col. 11, 44- col. 12, 63 and elsewhere. Combined components of a silica precursor, metal-bearing precursor and templating agents are spray-dried (spraying, per claims 61) to form the metal oxide templated on the silica mesostructure during spray drying, followed by a calcination step (claims 50,57).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 51,58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pham et al. Pham is cited for the same reasons previously discussed, which are incorporated herein. While Pham explicitly teaches calcination of spray-dried metal-containing nano- particles templated on mesoporous silica (col. 11, 49-51, etc), all ranges of applicable calcination temperatures are not cited. However, the examples include temperatures of about 260-400 C in various atmospheres for different times, dependant upon the materials to be formed. It is the Examiner's position that one of ordinary skill would have recognized that (1) different precursors and outcomes require different calcination times/ temperatures/ atmospheres, and further (2) time and temperature are cause-effective calcination variables, such that calcination would have been optimized by routine experimentation by modifying time versus temperature to form a desired microstructure and nano-particle. Such process variables would have been within the purview of one of ordinary skill in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Pham by optimizing calcination conditions by routine experimentation to effectively remove the organic templating agents while maintaining the particle-containing mesoporous structure.

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12. Claims 48,55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pham et al in view of Tanev et al.

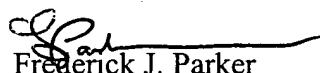
Pham is cited for the same reasons previously discussed, which are incorporated herein. Tanev et al teaches forming templated mesoporous silica materials, in which the materials are prepared by combining amines in water with ethanol (alcohol) and TEOS, and then aged to produce material for the desired hexagonal mesoporous silica. Since Tanev et al teaches mesoporous silica to be templated similar to that of Pham, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pham by incorporating the teachings of Tanev et al to form the specific hexagonal mesoporous silica because of the expectation of providing a hexagonal arrayed mesoporous silica containing nano-particles, including metal or metal-oxide or ceramic containing nano-particles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571/272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Frederick J. Parker  
Primary Examiner  
Art Unit 1762

fjp